

CLAIMS

What is claimed is:

1. A peptide which comprises a subsequence: SRFEVW (SEQ ID NO: 22).

2. A peptide in accordance with claim 1, comprising the formula: X₄-X₃-X₂-X₁-X₅-X₆, where
X₁ is SRFEVW,
X₂ is WI,
X₃ is GIVRK,
X₄ is EN,
X₅ is PYL, and
X₆ is KK,
wherein the peptide comprises X₁ and optionally at least one of X₂, X₃, X₄, X₅ and X₆, and if any of X₂, X₃, X₄, X₅ and X₆ are present, the amino acids are identical in their respective positions to those in ENGIVRKWISRFEVWPYLYKK (SEQ ID NO: 24)
as set forth in Figure 1B.

3. A peptide of claim 1 which is up to 100 amino acids in length.

4. A peptide of claim 1, wherein the peptide is at least 80% homologous with a portion of native *Zea mays* protein sequence as set forth in GenBank Accession Number 1498382, and said homology is over the entire length of the peptide; or,
wherein said peptide causes 50% bundled actin and inhibits actin depolymerization when polymerized in vitro with actin at a molar ratio of 100 to 1; or,
wherein the peptide is at least 80% homologous with a portion of native *Zea mays* protein sequence as set forth in GenBank Accession Number 1498382, and said homology is over the entire length of the peptide, and wherein said peptide causes actin bundling and inhibits actin depolymerization when polymerized in vitro with actin.

5. A peptide having the sequence E-GI*---W-----W, where, I* means I or V, - means any amino acid, wherein said peptide causes actin bundling and inhibits actin depolymerization.
6. A peptide in accordance with claim 5, comprising a sequence: EH*GIV*R*-W-----V* W, where H* means H or a conservative substitution therefore, V* means V or a conservative substitution therefore, and R* means R or a conservative substitution therefore, and - means any amino acid, wherein said peptide causes actin bundling and inhibits actin depolymerization.
7. A peptide in accordance with claim 6, wherein the peptide causes 50% bundled actin and inhibits actin depolymerization when polymerized in vitro with actin.
8. A peptide in accordance with claim 7, wherein the peptide is polymerized with actin at a molar ratio of peptide to actin of at least 100:1.
9. A peptide of claim 5, wherein the sequence comprises SEQ ID NO: 12.

5. A peptide having the sequence E-GI*---W-----W, where, I* means I or V, - means any amino acid, wherein said peptide causes actin bundling and inhibits actin depolymerization.
6. A peptide in accordance with claim 5, comprising a sequence: EH*GIV*R*-W-----V* W, where H* means H or a conservative substitution therefore, V* means V or a conservative substitution therefore, and R* means R or a conservative substitution therefore, and - means any amino acid, wherein said peptide causes actin bundling and inhibits actin depolymerization.
7. A peptide in accordance with claim 6, wherein the peptide causes 50% bundled actin and inhibits actin depolymerization when polymerized in vitro with actin.
8. A peptide in accordance with claim 7, wherein the peptide is polymerized with actin at a molar ratio of peptide to actin of at least 100:1.
9. A peptide of claim 5, wherein the sequence comprises SEQ ID NO: 12.

10. A peptide comprising at least 16 contiguous amino acids in accordance with the formula:

Gly-Ile-X₁-X₂-X₃-Trp-X₄-X₅-X₆-X₇-X₈-X₉-Trp-X₁₀-X₁₁-X₁₂
or a pharmaceutically acceptable salt thereof, wherein

X₁ is Ile, Val, or Leu;

X₂ is Arg, Lys, Asn, or Thr;

X₃ is Arg, Lys, Asn, or Asp;

X₄ is Ile, Asp, Asn, or Glu;

X₅ is Ser or Asp;

X₆ is Arg, Met, or Ala;

X₇ is Phe or Glu;

X₈ is Asp, Glu, Lys, Arg, or His;

X₉ is Val or Ile;

X₁₀ is Pro or His;

X₁₁ is Tyr or His; and

X₁₂ is Leu or Thr;

wherein the addition of said compound results in about 50% of bundled actin in a molar fraction of peptide to actin of at least 100 to 1.